



4-05-02

75030

PATENT
Atty. Dkt. AMAT/5730/TCG/WCVD/LE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Yoo, et al.

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

§

The Applicants do not feel that a fee is necessary at this time, but if the sum of \$180.00 is due under 37 CFR § 1.17(p) pursuant to § 1.97, the Commissioner is hereby authorized to charge this fee, and any other fee necessary to make this submission timely, to the Deposit Account No. 20-0782/AMAT/5730/TCG/WCVD/LE/BTP.

Respectfully submitted,

B. Todd Patterson
B. Todd Patterson
Registration No. 37,906
MOSER, PATTERSON & SHERIDAN, L.L.P.
3040 Post Oak Blvd., Suite 1500
Houston, TX 77056
Telephone: (713) 623-4844
Facsimile: (713) 623-4846
Attorney for Applicants

| U.S. Department of Commerce, Patent and Trademark Office (PTO Form 1449 modified) | | | | Docket No. AMAT/5730 | | Serial No. 10/023,125 | | |
|---|-----|---|------------|--|-------|--------------------------|----------------------------|---|
| LIST OF PATENTS AND PUBLICATIONS CITED BY APPLICANT | | | | APR 03 2002 56 PATENT & TRADEMARK OFFICE U.S. DEPARTMENT OF COMMERCE JO | | | | |
| (Use several sheets if necessary) | | | | Filing Date December 17, 2001 | | Group Unknown | | |
| Examiner Unknown | | | | | | | | |
| U.S. Patent Documents | | | | | | | | |
| *Examiner Initial | | Document Number | Issue Date | Applicant(s) Name | Class | Subclass | Filing Date If Appropriate | |
| | A1 | 4,058,430 | 11/15/77 | Suntola et al. | 156 | 611 | 11/25/1975 | |
| | A2 | 4,389,973 | 06/28/83 | Suntola et al. | 118 | 725 | 12/11/1981 | |
| | A3 | 4,413,022 | 11/01/83 | Suntola et al. | 427 | 255.2 | 06/21/1979 | |
| | A4 | 4,486,487 | 12/04/84 | Skarp | 428 | 216 | 04/25/1983 | |
| | A5 | 4,767,494 | 08/30/88 | Kobayashi et al. | 156 | 606 | 09/19/1986 | |
| | A6 | 4,806,321 | 02/21/89 | Nishizawa et al. | 422 | 245 | 07/21/1985 | |
| | A7 | 4,829,022 | 05/09/89 | Kobayashi et al. | 437 | 107 | 12/09/1986 | |
| | A8 | 4,834,831 | 05/30/89 | Nishizawa et al. | 156 | 611 | 09/04/1987 | |
| | A9 | 4,838,983 | 06/13/89 | Schumaker et al. | 156 | 613 | 03/18/1988 | |
| | A10 | 4,838,993 | 06/13/89 | Aoki et al. | 156 | 643 | 12/03/1987 | |
| | A11 | 4,840,921 | 06/20/89 | Matsumoto | 437 | 89 | 06/30/1988 | |
| | A12 | 4,845,049 | 07/04/89 | Sunakawa | 437 | 81 | 03/28/1988 | |
| | A13 | 4,859,625 | 08/22/89 | Nishizawa et al. | 437 | 81 | 11/20/1987 | |
| Foreign Patent Documents | | | | | | | | |
| *Examiner Initial | | Document Number | Date | Country | Class | Subclass | Translation | |
| | | | | | | | YES NO | |
| | B1 | 01/66832 A2 | 09/13/2001 | WO | C30B | 16/44 | | X |
| | B2 | 01/40541 A1 | 06/07/2001 | WO | C23C | 16/40 | | X |
| | B3 | 01/36702 A1 | 05/25/2001 | WO | C23C | 16/00 | | X |
| | B4 | 01/29893 A1 | 04/26/2001 | WO | H01L | 21/768 | | X |
| | B5 | 01/29891 A1 | 04/26/2001 | WO | H01L | 21/768 | | X |
| OTHER ART | | | | | | | | |
| *Examiner Initial | | Including Author, Title, Date, Pertinent Pages, Etc. | | | | | | |
| | C1 | Hultman, et al., "Review of the thermal and mechanical stability of TiN-based thin films", <i>Zeitschrift Fur Metallkunde</i> , 90(10) (Oct. 1999), pp. 803-813. | | | | | | |
| | C2 | Klaus, et al., "Atomic Layer Deposition of SiO ₂ Using Catalyzed and Uncatalyzed Self-Limiting Surface Reactions", <i>Surface Review & Letters</i> , 6(3&4) (1999), pp. 435-448. | | | | | | |
| Examiner | | | | Date Considered | | | | |
| *EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant. | | | | | | | | |

| U.S. Department of Commerce, Patent and Trademark Office (PTO Form 1449 modified) | | | | Docket No. AMAT/5730 | | Serial No. 10/023,125 | | |
|---|-----|---|------------|--|-------|--------------------------|----------------------------|----|
| LIST OF PATENTS AND PUBLICATIONS CITED BY APPLICANT | | | | APR 03 2002 C5 PATENT & TRADEMARK OFFICE | | | | |
| (Use several sheets if necessary) | | | | Filing Date December 17, 2001 | | Group Unknown | | |
| Examiner Unknown | | | | | | | | |
| U.S. Patent Documents | | | | | | | | |
| *Examiner Initial | | Document Number | Issue Date | Applicant(s) Name | Class | Subclass | Filing Date If Appropriate | |
| | A14 | 4,859,627 | 08/22/89 | Sunakawa | 437 | 81 | 07/01/1988 | |
| | A15 | 4,861,417 | 08/29/89 | Mochizuki et al. | 156 | 610 | 03/24/1988 | |
| | A16 | 4,876,218 | 10/24/89 | Pessa et al. | 437 | 107 | 09/26/1988 | |
| | A17 | 4,927,670 | 05/22/1990 | Erbil | 427 | 255.3 | 06/22/1988 | |
| | A18 | 4,931,132 | 06/05/90 | Aspnes et al. | 156 | 601 | 10/07/1988 | |
| | A19 | 4,960,720 | 10/02/90 | Shimbo | 437 | 105 | 08/24/1987 | |
| | A20 | 4,975,252 | 12/04/90 | Nishizawa et al. | 422 | 245 | 05/26/1989 | |
| | A21 | 4,993,357 | 02/19/91 | Scholz | 118 | 715 | 12/21/1989 | |
| | A22 | 5,013,683 | 05/07/91 | Petroff et al. | 437 | 110 | 01/23/1989 | |
| | A23 | 5,082,798 | 01/21/92 | Arimoto | 437 | 108 | 09/27/1990 | |
| | A24 | 5,085,885 | 02/04/92 | Foley et al. | 477 | 38 | 09/10/1990 | |
| | A25 | 5,091,320 | 02/25/92 | Aspnes et al. | 437 | 8 | 06/15/1990 | |
| | A26 | 5,130,269 | 07/14/92 | Kitahara et al. | 437 | 111 | 04/25/1989 | |
| | A27 | 5,166,092 | 11/24/92 | Mochizuki et al. | 437 | 105 | 10/30/1990 | |
| Foreign Patent Documents | | | | | | | | |
| *Examiner Initial | | Document Number | Date | Country | Class | Subclass | Translation | |
| | | | | | | | YES | NO |
| | B6 | 01/29280 A1 | 04/26/2001 | WO | C23C | 16/32 | | X |
| | B7 | 01/27347 A1 | 04/19/2001 | WO | C23C | 16/44 | | X |
| | B8 | 01/27346 A1 | 04/19/2001 | WO | C23C | 16/44 | | X |
| | B9 | 01/15220 A1 | 03/01/2001 | WO | H01L | 21/768 | | X |
| OTHER ART | | | | | | | | |
| *Examiner Initial | | Including Author, Title, Date, Pertinent Pages, Etc. | | | | | | |
| | C3 | Yamaguchi, et al., "Atomic-layer chemical-vapor-deposition of silicon dioxide films with extremely low hydrogen content", <i>Appl. Surf. Sci.</i> , Vol. 130-132 (1998), pp. 202-207. | | | | | | |
| | C4 | George, et al., "Surface Chemistry for Atomic Layer Growth", <i>J. Phys. Chem.</i> , Vol. 100 (1996), pp. 13121-131. | | | | | | |
| Examiner | | | | Date Considered | | | | |
| *EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant. | | | | | | | | |

| U.S. Department of Commerce, Patent and Trademark Office (PTO Form 1449 modified) | | | | Docket No. AMAT/5730 | | Serial No. 10/023,125 | | |
|---|-----|--|------------|--|-------|----------------------------------|----------------------------|----|
| LIST OF PATENTS AND PUBLICATIONS CITED BY APPLICANT | | | | Applicant Yoo, et al. | | | | |
| (Use several sheets if necessary) | | | | APR 03 2002 85 PATENT & TRADEMARK OFFICE | | Filing Date December 17, 2001 | Group Unknown | |
| U.S. Patent Documents | | | | | | | | |
| *Examiner Initial | | Document Number | Issue Date | Applicant(s) Name | Class | Subclass | Filing Date If Appropriate | |
| | A28 | 5,225,366 | 07/06/93 | Yoder | 437 | 108 | 06/22/1990 | |
| | A29 | 5,246,536 | 09/21/93 | Nishizawa et al. | 156 | 610 | 03/10/1989 | |
| | A30 | 5,250,148 | 10/05/93 | Nishizawa et al. | 156 | 611 | 11/12/1991 | |
| | A31 | 5,254,207 | 10/19/93 | Nishizawa et al. | 156 | 601 | 11/30/1992 | |
| | A32 | 5,256,244 | 10/26/93 | Ackerman | 156 | 613 | 02/10/1992 | |
| | A33 | 5,270,247 | 12/14/93 | Sakuma et al. | 437 | 133 | 07/08/1992 | |
| | A34 | 5,278,435 | 01/11/94 | Van Hove et al. | 257 | 184 | 06/08/1992 | |
| | A35 | 5,281,274 | 01/25/94 | Yoder | 118 | 697 | 02/04/1993 | |
| | A36 | 5,290,748 | 03/01/94 | Knuutila et al. | 502 | 228 | 07/16/1992 | |
| | A37 | 5,294,286 | 03/15/94 | Nishizawa et al. | 156 | 610 | 01/12/1993 | |
| | A38 | 5,296,403 | 03/22/94 | Nishizawa et al. | 437 | 133 | 10/23/1992 | |
| | A39 | 5,300,186 | 04/05/94 | Kitahara et al. | 156 | 613 | 04/07/1992 | |
| | A40 | 5,311,055 | 05/10/94 | Goodman et al. | 257 | 593 | 11/22/1991 | |
| Foreign Patent Documents | | | | | | | | |
| *Examiner Initial | | Document Number | Date | Country | Class | Subclass | Translation | |
| | | | | | | | YES | NO |
| | B10 | 00/79576 A1 | 12/28/2000 | WO | H01L | 21/205 | | X |
| | B11 | 00/79019 A1 | 12/28/2000 | WO | C23C | 16/00 | | X |
| | B12 | 00/63957 A1 | 10/26/2000 | WO | H01L | 21/205 | | X |
| OTHER ART | | | | | | | | |
| *Examiner Initial | | Including Author, Title, Date, Pertinent Pages, Etc. | | | | | | |
| | C5 | George, et al., "Atomic layer controlled deposition of SiO ₂ and Al ₂ O ₃ using ABAB...binary reaction sequence chemistry", <i>Appl. Surf. Sci.</i> , Vol. 82/83 (1994), pp. 460-467. | | | | | | |
| | C6 | Wise, et al., "Diethyldiethoxysilane as a new precursor for SiO ₂ growth on silicon", <i>Mat. Res. Soc. Symp. Proc.</i> , Vol. 334 (1994), pp. 37-43. | | | | | | |
| Examiner | | | | Date Considered | | | | |
| *EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant. | | | | | | | | |

| U.S. Department of Commerce, Patent and Trademark Office (PTO Form 1449 modified) | | | | Docket No. AMAT/5730 | | Serial No. 10/023,125 | | | | | | | | | |
|--|---------|---|------------|----------------------------------|-------|--------------------------|----------------------------|----------|---------|---|--|--|--|--|--|
| LIST OF PATENTS AND PUBLICATIONS CITED BY APPLICANT | | | | Applicant Yoo, et al. | | | | | | | | | | | |
| (Use several sheets if necessary) | | | | Filing Date December 17, 2001 | | Group Unknown | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Examiner</td> <td style="width: 10%;">Unknown</td> <td colspan="6" style="text-align: center; font-size: small; font-style: italic;">O P E APR 03 2002 P A T E N T & T R A D E M A R K O F F I C E</td> </tr> </table> | | | | | | | | Examiner | Unknown | O P E APR 03 2002 P A T E N T & T R A D E M A R K O F F I C E | | | | | |
| Examiner | Unknown | O P E APR 03 2002 P A T E N T & T R A D E M A R K O F F I C E | | | | | | | | | | | | | |
| U.S. Patent Documents | | | | | | | | | | | | | | | |
| *Examiner Initial | | Document Number | Issue Date | Applicant(s) Name | Class | Subclass | Filing Date If Appropriate | | | | | | | | |
| | A41 | 5,316,615 | 05/31/94 | Copel | 117 | 95 | 03/09/1993 | | | | | | | | |
| | A42 | 5,316,793 | 05/31/94 | Wallace et al. | 427 | 248.1 | 07/27/1992 | | | | | | | | |
| | A43 | 5,330,610 | 07/19/94 | Eres et al. | 117 | 86 | 05/28/1993 | | | | | | | | |
| | A44 | 5,336,324 | 08/09/94 | Stall et al. | 118 | 719 | 12/04/1991 | | | | | | | | |
| | A45 | 5,338,389 | 08/16/94 | Nishizawa et al. | 117 | 89 | 04/21/1993 | | | | | | | | |
| | A46 | 5,348,911 | 09/20/94 | Jurgensen et al. | 117 | 91 | 04/26/1993 | | | | | | | | |
| | A47 | 5,374,570 | 12/20/94 | Nasu et al. | 437 | 40 | 08/19/1993 | | | | | | | | |
| | A48 | 5,395,791 | 03/07/95 | Cheng et al. | 437 | 105 | 10/20/1993 | | | | | | | | |
| | A49 | 5,438,952 | 08/08/1995 | Otsuka | 117 | 84 | 01/31/1994 | | | | | | | | |
| | A50 | 5,439,876 | 08/08/95 | Graf et al. | 505 | 447 | 08/16/1993 | | | | | | | | |
| | A51 | 5,441,703 | 08/15/95 | Jurgensen | 422 | 129 | 03/29/1994 | | | | | | | | |
| | A52 | 5,443,033 | 08/22/95 | Nishizawa et al. | 117 | 86 | 03/11/1994 | | | | | | | | |
| | A53 | 5,443,647 | 08/22/95 | Aucoin et al. | 118 | 723 ME | 07/11/1994 | | | | | | | | |
| | A54 | 5,455,072 | 10/03/95 | Bension et al. | 427 | 255.7 | 11/18/1992 | | | | | | | | |
| Foreign Patent Documents | | | | | | | | | | | | | | | |
| *Examiner Initial | | Document Number | Date | Country | Class | Subclass | Translation | | | | | | | | |
| | | | | | | | YES | NO | | | | | | | |
| | B13 | 00/54320 A1 | 09/14/2000 | WO | H01L | 21/44 | | X | | | | | | | |
| | B14 | 00/16377 A2 | 03/23/2000 | WO | H01L | --- | | X | | | | | | | |
| | B15 | 00/15881 A2 | 03/23/2000 | WO | C30B | --- | | X | | | | | | | |
| | B16 | 00/15865 A1 | 03/23/2000 | WO | C23C | 16/00 | | X | | | | | | | |
| OTHER ART | | | | | | | | | | | | | | | |
| *Examiner Initial | | Including Author, Title, Date, Pertinent Pages, Etc. | | | | | | | | | | | | | |
| | C7 | Niinisto, et al., "Synthesis of oxide thin films and overlayers by atomic layer epitaxy for advanced applications", <i>Mat. Sci. & Eng.</i> , Vol. B41 (1996), pp. 23-29. | | | | | | | | | | | | | |
| Examiner | | | | Date Considered | | | | | | | | | | | |
| <p>*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant.</p> | | | | | | | | | | | | | | | |

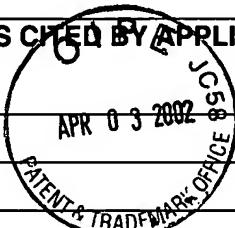
| U.S. Department of Commerce, Patent and Trademark Office (PTO Form 1449 modified) | | | | | Docket No. AMAT/5730 | | Serial No. 10/023,125 | |
|---|-----|--|------------|-------------------|---|----------|----------------------------|----|
| LIST OF PATENTS AND PUBLICATIONS CITED BY APPLICANT | | | | | APR 03 2002 O P E PATENT & TRADEMARK OFFICE | | | |
| (Use several sheets if necessary) | | | | | Filing Date December 17, 2001 | | Group Unknown | |
| | | | | | | | | |
| U.S. Patent Documents | | | | | | | | |
| *Examiner Initial | | Document Number | Issue Date | Applicant(s) Name | Class | Subclass | Filing Date If Appropriate | |
| | A55 | 5,458,084 | 10/17/95 | Thorne et al. | 117 | 89 | 12/09/1993 | |
| | A56 | 5,469,806 | 11/28/95 | Mochizuki et al. | 117 | 97 | 08/20/1993 | |
| | A57 | 5,480,818 | 01/02/96 | Matsumoto et al. | 437 | 40 | 02/09/1993 | |
| | A58 | 5,483,919 | 01/16/96 | Yokoyama et al. | 117 | 89 | 08/17/1994 | |
| | A59 | 5,484,664 | 01/16/96 | Kitahara et al. | 428 | 641 | 01/21/1994 | |
| | A60 | 5,503,875 | 04/02/96 | Imai et al. | 427 | 255.3 | 03/17/1994 | |
| | A61 | 5,521,126 | 05/28/96 | Okamura et al. | 437 | 235 | 06/22/1994 | |
| | A62 | 5,527,733 | 06/18/96 | Nishizawa et al. | 437 | 160 | 02/18/1994 | |
| | A63 | 5,532,511 | 07/02/96 | Nishizawa et al. | 257 | 627 | 03/23/1995 | |
| | A64 | 5,540,783 | 07/30/96 | Eres et al. | 118 | 725 | 05/26/1994 | |
| | A65 | 5,601,651 | 02/11/97 | Watabe | 118 | 715 | 12/14/1994 | |
| | A66 | 5,616,181 | 04/01/97 | Yamamoto et al. | 118 | 723 ER | 11/21/1995 | |
| | A67 | 5,637,530 | 06/10/97 | Gaines et al. | 114 | 105 | 06/10/1996 | |
| Foreign Patent Documents | | | | | | | | |
| *Examiner Initial | | Document Number | Date | Country | Class | Subclass | Translation | |
| | | | | | | | YES | NO |
| | B17 | 99/41423 A2 | 08/19/1999 | WO | C23C | --- | | X |
| | B18 | 99/29924 A1 | 06/17/1999 | WO | C23C | 16/04 | | X |
| | B19 | 99/01595 | 01/14/1999 | WO | C30B | 25/14 | | X |
| | B20 | 96/18756 A1 | 06/20/1996 | WO | C23C | 16/08 | | X |
| OTHER ART | | | | | | | | |
| *Examiner Initial | | Including Author, Title, Date, Pertinent Pages, Etc. | | | | | | |
| | C8 | Ritala, et al., "Perfectly conformal TiN and Al ₂ O ₃ films deposited by atomic layer deposition", <i>Chemical Vapor Deposition</i> , Vol. 5(1) (January 1999), pp. 7-9. | | | | | | |
| | C9 | Klaus, et al., "Atomically controlled growth of tungsten and tungsten nitride using sequential surface reactions". <i>Appl. Surf. Sci.</i> , Vol 162-163 (2000), pp. 479-491. | | | | | | |
| Examiner | | | | | Date Considered | | | |
| *EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant. | | | | | | | | |

| U.S. Department of Commerce, Patent and Trademark Office (PTO Form 1449 modified) | | | | Docket No. AMAT/5730 | Serial No. 10/023,125 | | | |
|---|---------------------|--|------------|---|--------------------------|----------|----------------------------|----|
| LIST OF PATENTS AND PUBLICATIONS CITED BY APPLICANT (Use several sheets if necessary) | | | | APR 03 2002 O P E P A T E N T & T R A D E M A R K O F F I C E | Applicant Yoo, et al. | | | |
| | Examiner Unknown | | | Filing Date December 17, 2001 | Group Unknown | | | |
| U.S. Patent Documents | | | | | | | | |
| *Examiner Initial | | Document Number | Issue Date | Applicant(s) Name | Class | Subclass | Filing Date If Appropriate | |
| | A68 | 5,641,984 | 06/24/97 | Aftergut et al. | 257 | 433 | 08/19/1994 | |
| | A69 | 5,644,128 | 07/01/97 | Wollnik et al. | 250 | 251 | 08/25/1994 | |
| | A70 | 5,693,139 | 12/02/97 | Nishizawa et al. | 117 | 89 | 06/15/1993 | |
| | A71 | 5,705,224 | 01/06/98 | Murota et al. | 427 | 248.1 | 01/31/1995 | |
| | A72 | 5,707,880 | 01/13/98 | Aftergut et al. | 437 | 3 | 01/17/1997 | |
| | A73 | 5,711,811 | 01/27/98 | Suntola et al. | 118 | 711 | 11/28/1995 | |
| | A74 | 5,730,802 | 03/24/98 | Ishizumi et al. | 118 | 719 | 12/27/1996 | |
| | A75 | 5,747,113 | 05/05/98 | Tsai | 427 | 255.5 | 07/29/1996 | |
| | A76 | 5,749,974 | 05/12/98 | Habuka et al. | 118 | 725 | 07/13/1995 | |
| | A77 | 5,796,116 | 08/18/98 | Nakata et al. | 257 | 66 | 07/25/1995 | |
| | A78 | 5,807,792 | 09/15/98 | Ilg et al. | 438 | 758 | 12/18/1996 | |
| | A79 | 5,830,270 | 11/03/98 | McKee et al. | 117 | 106 | 08/05/1996 | |
| | A80 | 5,835,677 | 11/10/98 | Li et al. | 392 | 401 | 10/03/1996 | |
| Foreign Patent Documents | | | | | | | | |
| *Examiner Initial | | Document Number | Date | Country | Class | Subclass | Translation | |
| | | | | | | | YES | NO |
| | B21 | 96/17107 A1 | 06/06/1996 | WO | C23C | 16/44 | | X |
| | B22 | 93/02111 A1 | 02/04/1993 | WO | C08F | 4/78 | | X |
| | B23 | 91/10510 A1 | 07/25/1991 | WO | B01J | 37/02 | | X |
| | B24 | 0 799 641 A2 | 10/08/1997 | EP | B01J | 20/32 | | X |
| OTHER ART | | | | | | | | |
| *Examiner Initial | | Including Author, Title, Date, Pertinent Pages, Etc. | | | | | | |
| | C10 | Min, et al., "Atomic layer deposition of TiN thin films by sequential introduction of Ti precursor and NH _{sub} 3", Symp.: Advanced Interconnects and Contact Materials and Processes for Future Integrated Circuits (Apr. 13-16, 1998), pp. 337-342. | | | | | | |
| Examiner | | | | Date Considered | | | | |
| *EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant. | | | | | | | | |

| U.S. Department of Commerce, Patent and Trademark Office (PTO Form 1449 modified) | | | | Docket No. AMAT/5730 | Serial No. 10/023,125 | | | |
|---|-----|---|------------|----------------------------------|--------------------------|----------|----------------------------|----|
| LIST OF PATENTS AND PUBLICATIONS CITED BY APPLICANT (Use several sheets if necessary) | | | | Applicant Yoo, et al. | | | | |
| Examiner Unknown | | APR 03 2002 88 PATENT & TRADEMARK OFFICE | | Filing Date December 17, 2001 | Group Unknown | | | |
| U.S. Patent Documents | | | | | | | | |
| *Examiner Initial | | Document Number | Issue Date | Applicant(s) Name | Class | Subclass | Filing Date If Appropriate | |
| | A81 | 5,851,849 | 12/22/98 | Comizzoli et al. | 438 | 38 | 05/22/1997 | |
| | A82 | 5,855,675 | 01/05/99 | Doering et al. | 118 | 719 | 03/03/1997 | |
| | A83 | 5,855,680 | 01/05/99 | Soininen et al. | 118 | 719 | 11/28/1995 | |
| | A84 | 5,858,102 | 01/12/99 | Tsai | 118 | 719 | 02/14/1998 | |
| | A85 | 5,879,459 | 03/09/99 | Gadgil et al. | 118 | 715 | 08/29/1997 | |
| | A86 | 5,904,565 | 05/18/1999 | Nguyen, et al. | 438 | 687 | 07/17/1997 | |
| | A87 | 5,916,365 | 06/29/99 | Sherman | 117 | 92 | 08/16/1996 | |
| | A88 | 5,923,056 | 07/13/99 | Lee et al. | 257 | 192 | 03/12/1998 | |
| | A89 | 5,923,985 | 07/13/99 | Aoki et al. | 438 | 301 | 01/14/1997 | |
| | A90 | 5,925,574 | 07/20/99 | Aoki et al. | 437 | 31 | 04/10/1992 | |
| | A91 | 5,942,040 | 08/24/99 | Kim et al. | 118 | 726 | 08/27/1997 | |
| | A92 | 5,947,710 | 09/07/1999 | Cooper, et al. | 418 | 63 | 06/16/1997 | |
| | A93 | 5,972,430 | 10/26/99 | DiMeo, Jr. et al. | 427 | 255.32 | 11/26/1997 | |
| Foreign Patent Documents | | | | | | | | |
| *Examiner Initial | | Document Number | Date | Country | Class | Subclass | Translation | |
| | | | | | | | YES | NO |
| | B25 | 0 442 490 A1 | 08/21/1991 | EP | C30B | 25/02 | | X |
| | B26 | 0 344 352 A1 | 12/06/1989 | EP | H01L | 39/24 | | X |
| | B27 | 62-091495 A | 04/25/1987 | JP | C30B | 25/02 | | X |
| OTHER ART | | | | | | | | |
| *Examiner Initial | | Including Author, Title, Date, Pertinent Pages, Etc. | | | | | | |
| | C11 | Klaus, et al., "Atomic Layer Deposition of Tungsten using Sequential Surface Chemistry with a Sacrificial Stripping Reaction," <i>Thin Solid Films</i> 360 (2000), Pages 145 – 153, (Accepted Nov. 16, 1999). | | | | | | |
| | C12 | Min, et al., "Metal-Organic Atomic-Layer Deposition of Titanium-Silicon-Nitride Films", <i>Applied Physics Letters</i> , American Inst. Of Physics, Vol 75(11) (Sept. 13, 1999). | | | | | | |
| Examiner | | | | Date Considered | | | | |
| *EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant. | | | | | | | | |

| U.S. Department of Commerce, Patent and Trademark Office (PTO Form 1449 modified) | | | | Docket No. AMAT/5730 | Serial No. 10/023,125 | | | |
|---|---------------------|--|------------|---|--------------------------|----------|----------------------------|----|
| LIST OF PATENTS AND PUBLICATIONS CITED BY APPLICANT (Use several sheets if necessary) | | | | APR 03 2002 O P T E J C S PATENT & TRADEMARK OFFICE | Applicant Yoo, et al. | | | |
| | Examiner Unknown | | | Filing Date December 17, 2001 | Group Unknown | | | |
| U.S. Patent Documents | | | | | | | | |
| *Examiner Initial | | Document Number | Issue Date | Applicant(s) Name | Class | Subclass | Filing Date If Appropriate | |
| | A94 | 6,001,669 | 12/14/99 | Gaines et al. | 438 | 102 | 07/21/1992 | |
| | A95 | 6,015,590 | 01/18/00 | Suntola et al. | 427 | 255.23 | 11/28/1995 | |
| | A96 | 6,025,627 | 02/15/00 | Forbes et al. | 257 | 321 | 05/29/1998 | |
| | A97 | 6,036,773 | 03/14/00 | Wang et al. | 117 | 97 | 03/27/1997 | |
| | A98 | 6,042,652 | 03/28/00 | Hyun et al. | 118 | 719 | 09/07/1999 | |
| | A99 | 6,043,177 | 03/28/00 | Falconer et al. | 502 | 4 | 01/21/1997 | |
| | A100 | 6,124,158 | 09/26/00 | Dautartas et al. | 438 | 216 | 06/08/1999 | |
| | A101 | 6,113,977 | 09/05/00 | Soininen et al. | 427 | 64 | 09/11/1997 | |
| | A102 | 6,130,147 | 10/10/00 | Major et al. | 438 | 604 | 03/18/1997 | |
| | A103 | 6,139,700 | 10/31/00 | Kang et al. | 204 | 192.17 | 09/30/1998 | |
| | A104 | 6,174,377 | 01/16/2001 | Doering, et al. | 118 | 729 | 01/04/1999 | |
| | A105 | 6,174,809 | 01/16/2001 | Kang, et al. | 438 | 682 | 12/15/1998 | |
| Foreign Patent Documents | | | | | | | | |
| *Examiner Initial | | Document Number | Date | Country | Class | Subclass | Translation | |
| | | | | | | | YES | NO |
| | B28 | 60-065712 A | 04/15/1985 | JP | C01B | 33/113 | | X |
| | B29 | 03-048421 | 03/01/1991 | JP | H01L | 21/302 | | X |
| | B30 | 03-286531 | 12/17/1991 | JP | H01L | 21/316 | | X |
| OTHER ART | | | | | | | | |
| *Examiner Initial | | Including Author, Title, Date, Pertinent Pages, Etc. | | | | | | |
| | C13 | Martensson, et al., "Atomic Layer Epitaxy of Copper on Tantalum", <i>Chemical Vapor Deposition</i> , 3(1) (Feb. 1, 1997), pp. 45-50. | | | | | | |
| | C14 | Ritala, et al. "Atomic Layer Epitaxy Growth of TiN Thin Films", <i>J. Electrochem. Soc.</i> , 142(8) (Aug. 1995), pp. 2731-737. | | | | | | |
| | C15 | Elers, et al., "NbC15 as a precursor in atomic layer epitaxy", <i>Appl. Surf. Sci.</i> , Vol. 82/83 (1994), pp. 468-474. | | | | | | |
| Examiner | | | | Date Considered | | | | |
| *EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant. | | | | | | | | |

| | | | | | |
|--|---------------------|--|--|----------------------------------|--------------------------|
| U.S. Department of Commerce, Patent and Trademark Office (PTO Form 1449 modified) | | | | Docket No. AMAT/5730 | Serial No. 10/023,125 |
| LIST OF PATENTS AND PUBLICATIONS CITED BY APPLICANT | | | | Applicant Yoo, et al. | |
| (Use several sheets if necessary) | | | | Filing Date December 17, 2001 | Group Unknown |
| | Examiner Unknown | | | | |

**U.S. Patent Documents**

| *Examiner Initial | | Document Number | Issue Date | Applicant(s) Name | Class | Subclass | Filing Date If Appropriate |
|-------------------|------|-----------------|------------|-------------------|-------|----------|----------------------------|
| | A106 | 6,200,893 | 03/13/2001 | Sneh | 438 | 685 | 03/11/1998 |
| | A107 | 6,203,613 | 03/20/2001 | Gates, et al. | 117 | 104 | 10/19/1999 |
| | A108 | 6,207,302 | 03/27/2001 | Sugiura, et al. | 428 | 690 | 03/02/1998 |
| | A109 | 6,248,605 | 06/19/2001 | Harkonen, et al. | 438 | 29 | 06/02/1999 |
| | A110 | 6,270,572 | 08/07/2001 | Kim, et al. | 117 | 93 | 08/09/1999 |
| | A111 | 6,287,965 | 09/11/2001 | Kang, et al. | 438 | 648 | 02/23/2000 |
| | A112 | 6,291,876 | 09/18/2001 | Stumborg, et al. | 257 | 632 | 08/20/1998 |
| | A113 | 6,305,314 | 10/23/2001 | Sneh, et al. | 118 | 723 R | 12/17/1999 |
| | A114 | 6,306,216 | 10/23/2001 | Kim, et al. | 118 | 725 | 07/12/2000 |
| | A115 | 6,316,098 | 11/13/2001 | Yitzchaik, et al. | 428 | 339 | 03/23/1999 |
| | A116 | 2001/0000866 | 05/10/2001 | Sneh, et al. | 118 | 723 R | 11/29/2000 |
| | A117 | 2001/0009140 | 07/26/2001 | Bondestam, et al. | 118 | 725 | 01/25/2001 |

Foreign Patent Documents

| *Examiner Initial | | Document Number | Date | Country | Class | Subclass | Translation | |
|-------------------|-----|-----------------|------------|---------|-------|----------|-------------|----|
| | | | | | | | YES | NO |
| | B31 | 04-031396 A | 02/03/1992 | JP | C30B | 25/14 | | X |
| | B32 | 06-291048 | 10/18/1994 | JP | H01L | 21/205 | | X |
| | B33 | 08-264530 | 10/11/1996 | JP | H01L | 21/3205 | | X |
| | B34 | 11-269652 | 10/05/1999 | JP | C23C | 16/44 | | X |

OTHER ART

| | | |
|-------------------|-----|---|
| *Examiner Initial | | Including Author, Title, Date, Pertinent Pages, Etc. |
| | C16 | Lee, "The Preparation of Titanium-Based Thin Film by CVD Using Titanium Chlorides as Precursors", <i>Chemical Vapor Deposition</i> , 5(2) (Mar. 1999), pp. 69-73. |
| | C17 | Martensson, et al., "Atomic Layer Epitaxy of Copper, Growth & Selectivity in the Cu (II)-2,2,6,6-Tetramethyl-3, 5-Heptanedion ATE/H ₂ Process", <i>J. Electrochem. Soc.</i> , 145(8) (Aug. 1998), pp. 2926-2931. |

| Examiner | Date Considered |
|----------|-----------------|
| | |

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant.

| U.S. Department of Commerce, Patent and Trademark Office (PTO Form 1449 modified) | | | | Docket No. AMAT/5730 | | Serial No. 10/023,125 | | |
|---|------|---|-------------|---|-------|----------------------------------|----------------------------|----|
| LIST OF PATENTS AND PUBLICATIONS CITED BY APPLICANT | | | | Applicant Yoo, et al. | | | | |
| (Use several sheets if necessary) | | | | APR 03 2002 PATENT & TRADEMARK OFFICE U.S. DEPARTMENT OF COMMERCE | | Filing Date December 17, 2001 | Group Unknown | |
| U.S. Patent Documents | | | | | | | | |
| *Examiner Initial | | Document Number | Issue Date | Applicant(s) Name | Class | Subclass | Filing Date If Appropriate | |
| | A118 | 2001/0011526 | 08/09/2001 | Doering, et al. | 118 | 729 | 01/16/2001 | |
| | A119 | 2001/0031562 | 10/18/2001 | Raaijmakers, et al. | 438 | 770 | 02/22/2001 | |
| | A120 | 2001/0034123 | 10/25/2001 | Jeon, et al. | 438 | 643 | 04/06/2001 | |
| | A121 | | | | | | | |
| | A122 | | | | | | | |
| | A123 | | | | | | | |
| Foreign Patent Documents | | | | | | | | |
| *Examiner Initial | | Document Number | Date | Country | Class | Subclass | Translation | |
| | | | | | | | YES | NO |
| | B35 | 2001-62244 | 03/13/2001 | JP | B01D | 53/34 | | X |
| | B36 | 198 20 147 | 07/01/1999 | DE | H01L | 21/3205 | | X |
| | B37 | 196 27 017 | 01/09/1997 | DE | H01L | 21/283 | | X |
| | B38 | 2 626 110 | 07/21/1989 | FR | H01L | 39/24 | | X |
| | B39 | 2 692 597 | 12/24/1993 | FR | C23C | 16/00 | | X |
| | B40 | 2 355 727A | 05/02/12001 | GB | C23C | 16/44 | | X |
| OTHER ART | | | | | | | | |
| *Examiner Initial | | Including Author, Title, Date, Pertinent Pages, Etc. | | | | | | |
| | C18 | Min, et al., "Chemical Vapor Deposition of Ti-Si-N Films with Alternating Source Supply", <i>Mat., Res. Soc. Symp. Proc.</i> , Vol. 564 (Apr. 5, 1999), pp. 207-210 | | | | | | |
| | C19 | Bedair, "Atomic layer epitaxy deposition processes", <i>J. Vac. Sci. Technol.</i> 12(1) (Jan/Feb 1994) | | | | | | |
| | C20 | Yamaga, et al., "Atomic layer epitaxy of ZnS by a new gas supplying system in a low-pressure metalorganic vapor phase epitaxy", <i>J. of Crystal Growth</i> 117 (1992), pp. 152-155 | | | | | | |
| | C21 | Elam, et al., "Nucleation and growth during tungsten atomic layer deposition on SiO ₂ surfaces," <i>Thin Solid Films</i> 386 (2001) Pages 41 – 52, (Accepted Dec. 14, 2000). | | | | | | |
| Examiner | | | | Date Considered | | | | |
| *EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant. | | | | | | | | |